

PATENT SPECIFICATION

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(54) IMPROVEMENTS RELATING TO SPINNING

(71) We, JAMES MACKIE & SONS LIMITED, a British company, of Albert Foundry, Belfast BT12 7ED, Northern Ireland, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

- 10 This invention relates to ring spinning or ring twisting and is particularly concerned with the balloonless form of operation in which the balloon is suppressed by means of an extension piece which is fitted to the spindle and is formed at its upper end with a head portion shaped so as to prevent the yarn slipping freely round it. This head portion is generally formed with a number of radially-extending wings and one form of construction is described in our earlier patent specification No. 1,034,456. According to this earlier specification the head portion is formed with a number of radial wings separated by V-shaped grooves, the edge of each wing having a curvature which extends downwardly and inwardly from the point of maximum diameter and then reverses to extend downwardly to a point of minimum diameter below which the diameter of the extension piece increases again. The edge of each wing may extend upwardly and inwardly in a smooth curve from the point of maximum diameter.
- 35 The extension piece is commonly made of aluminium or light alloy in order to obtain lightness because of the very high speeds at which spindles of this type operate. It is not unusual for laps of yarn to become wound around the head portion and to remove these the machine operator often uses a knife or other sharp instrument which is liable to notch or otherwise damage the soft material of the head portion. The notch then tends to catch the
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yarn during spinning and thus damages it.

According to the present invention, an extension piece shaped in accordance with Specification No. 1,034,456, as set out above, comprises a main body made of aluminium or light alloy and a separate head portion fixed to the main body and at least the surface of which is of hard, wear-resisting material. In other words the surface of the head portion is considerably harder than the main body of the extension piece and may be made of cast iron or hardened steel or of a softer material provided with a wear-resisting surface layer or finish. In this way, any risk of damage by means of a knife or other sharp instrument is very largely avoided and since the head portion is separate from the main body, it can be readily replaced without the need for changing the extension piece as a whole. Any laps which are formed collect on the head portion rather than on the main body of the extension piece so that there is no risk of damaging the latter when removing the laps.

The head portion may conveniently be screwed onto the main body of the extension piece and to avoid any risk of the yarn being caught by a discontinuity at the junction between the two, the lower end of the head portion is preferably formed with a recess for the reception of the upper end of the main body. As a result of this the head portion overlaps the main body and a small inward step is formed at this point with which there is no risk of the yarn catching.

A construction in accordance with the invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view showing a head portion separated from the main

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body of the extension piece with which it is to be used; and

Figure 2 is a cross-sectional view through the head portion and the upper part of the main body of the extension piece, with the head portion fixed in position.

In both Figures of the drawings, the head portion itself is shown as 1 and the main body of the extension piece with which it is to be used as 2, the extension piece being intended for fitting to the top of a balloonless spindle, not shown in the drawings. For this purpose, the main body 2 is formed with a downwardly extending projection 3. The head portion 1 is formed of cast iron or hardened steel and is fixed to the main body 2 by a downwardly extending stud 5 which screws into a tapped hole 6 at the top of the main body 2. The hard nature of the head portion 1 prevents it being damaged by a knife or other sharp instrument when laps of yarn are being removed by the operator, and since the main body 2 is not susceptible to damage in the same way it is made of aluminium or other light alloy. As best seen from Figure 1 of the drawings, the conical main body 2 is formed with flats 8 to reduce the area of contact between the main body 2 and the yarn which is shown in Figure 2 as 11.

The upper part of the head portion is formed with a number of radial, rounded wings 13 separated by V-shaped grooves 14 and, as best seen in Figure 2, the edge of each wing has a curvature which extends downwardly and inwardly at 15 from the point of maximum diameter 16 and then reverses at 17 to extend downwardly to a point of minimum diameter immediately below this. From there downwardly, the lower part of the head portion 1 constitutes a neck portion 20 of diameter less than that of the wings 13 but having an axial length very slightly greater than that of the wings. The length of the neck portion 20 ensures that any laps which may form will be on the neck itself rather than on the main body 2 of the extension piece which, as previously described, is formed of much softer material and would thus be liable to damage by a knife. As shown, the neck portion 20 is cylindrical but, as an alternative, it may be formed with flats in a similar manner to the main body 2 so as to reduce the area of contact with the yarn 11. The head portion 1 is intended to be formed as a moulding or casting and for this reason the neck portion 20 is parallel-sided.

Figure 2 shows part of the path of the yarn 11 as it passes firstly round the wings

13, then round the neck portion 20 and after that round the main body 2 of the extension piece before passing to the spindle to which the extension piece is fitted. The tension in the yarn keeps it in engagement with the wings 13 as spinning or twisting proceeds and thus suppresses the formation of a balloon. The shaping of the wings already described assists the yarn to slip from one wing to the next, thus maintaining a substantially uniform tension in the yarn, leading to improved spinning or twisting. The neck portion 20 is formed at its lower end with a recess for the reception of the upper end of the main body 2 so that the neck portion extends over the main body as seen at 21, a small step 22 thus being left at the bottom of the neck portion, over which the yarn can pass quite smoothly without the risk of being caught.

The shaping of the head portion leads to efficient spinning of twisting as already described and providing it with a hard surface and making it separately from the extension piece, any risk of damage by a knife or other instrument is avoided without the necessity for making the whole of the extension, i.e. parts 1 and 2 together of heavier material.

WHAT WE CLAIM IS:—

1. An extension piece for a spindle of a ring spinning machine according to claim 1 or claim 2 of Patent No. 1,034,456, the extension piece comprising a main body made of aluminium or light alloy and a separate head portion fixed to the main body and at least the surface of which is of hard, wear-resisting material.
2. An extension piece according to claim 1, in which the lower part of the head portion has substantially parallel sides.
3. An extension piece according to claim 1 or claim 2, in which the lower end of the head portion is formed with a recess for the reception of the upper end of the main body.
4. An extension piece according to any one of the preceding claims, in which the head portion is formed off cast iron or hardened steel.
5. An extension piece for a spindle of a ring spinning machine to give balloonless spinning substantially as described and as illustrated in the accompanying drawings.

For the Applicants:—

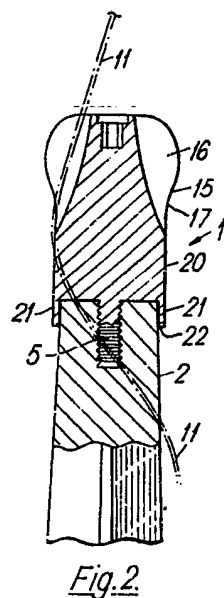
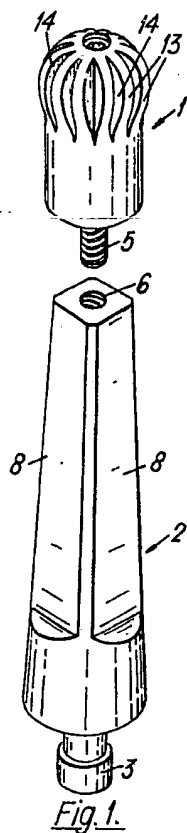
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COMPLETE SPECIFICATION

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